

## Claims

I claim:

1. A self-spotting apparatus for free-weights comprising:  
a frame;  
an elongated weight support assembly attached to said frame;  
a first weight engagement assembly operably attachable to said free-weights, translatable  
5 along said elongated weight support assembly towards a first end when said free-weights  
are lowered due to gravity and comprising a first engagement element selectively  
engageable with said elongated weight support assembly to prevent translation along said  
elongated weight support assembly towards said first end; and  
a second weight engagement assembly translatable along said elongated weight support  
10 assembly and disposed on said weight support assembly between said first weight  
engagement assembly and said first end and comprising a second engagement element  
selectively engageable to said elongated weight support assembly to prevent translation  
of said first weight engagement assembly towards said first end.
2. The self-spotting apparatus of claim 1 wherein said second weight engagement  
assembly comprises a spring operably attached to said second engagement element for  
biasing said second engagement element to engage said elongated weight support  
assembly.
3. The self-spotting apparatus of claim 2 wherein said second weight engagement  
assembly comprises a disengagement element operably attached to said second  
engagement element and comprising a first surface portion engageable by a hand of an  
operator.
4. The self-spotting apparatus of claim 3 wherein said spring is operably attached to said  
disengagement element and said second weight engagement assembly comprises a

bearing engaging said disengagement element to define an engaged position of said second weight engagement assembly wherein said second engagement element is engaged to said elongated weight support assembly and a disengaged position of said second weight engagement assembly wherein said second engagement element is disengaged to said elongated weight support assembly when said first surface portion is engaged by said hand of said operator.

5. The self-spotting apparatus of claim 1 wherein said elongated weight support assembly is a column comprising a plurality of engagement holes and said second engagement element of said second weight engagement assembly is a pin engageable in one of said plurality of holes.

6. The self-spotting apparatus of claim 5 wherein said second weight engagement assembly comprises a frame comprising a rectangular cross section and a sliding clearance with said column.

7. The self-spotting apparatus of claim 2 wherein said second weight engagement assembly comprises a solenoid operably connected to said second engagement element whereby said second weight engagement assembly is disengaged from said elongated weight support assembly when said solenoid is energized.

8. The self-spotting apparatus of claim 1 wherein said second weight engagement assembly comprises a hand grip fixed to said second weight engagement assembly and extending outward from said second weight engagement assembly to define a lift surface whereby a hand of an operator can raise or lower said second weight engagement assembly along said elongated weight support assembly.

9. The self-spotting apparatus of claim 8 wherein said hand grip extends vertically from said second weight engagement assembly to define a reaction surface for hand engagement of a disengagement element operably attached to said second engagement element.

10. A stop assembly for limiting the translation of a weight engagement assembly along an elongated weight support assembly of a free-weight apparatus comprising:  
a frame portion comprising a cross sectional shape defining a sliding fit with said elongated weight support assembly;
- 5 an engagement element operably attached to the frame portion to define an engaged position with said engagement element biased inwardly from said frame by a bias element and a disengaged position with said engagement element retracted against the bias of said bias element by a disengagement element operably attached to said frame; and
- 10 a hand positioning grip extending outwardly from said frame whereby a hand of an operator can position said stop assembly along said elongated weight support assembly.
11. The stop assembly of claim 10 comprising a load-bearing surface disposed on an end of said weight engagement assembly.
12. The stop assembly of claim 11 wherein said engagement element is a pin attached to said disengagement element.
13. The stop assembly of claim 12 wherein said bias element is a spring operably attached to said pin and said disengagement element.
14. The stop assembly of claim 13 wherein said hand positioning grip comprises a vertically extending portion providing a reaction surface for positioning said disengagement element against spring bias.
15. The stop assembly of claim 14 wherein said frame portion is of rectangular cross section.
16. The stop assembly of claim 15 wherein said disengagement element is a U-shaped bar supported by a sliding bearing on each of two sides of said frame portion.

17. The stop assembly of claim 16 wherein said pin is attached to a cross beam disposed on a back portion of said frame portion and insertable through an opening in said back portion of said frame and said spring is disposed between said cross beam and a back support plate attached to said back portion of said frame portion.

18. The stop assembly of claim 15 comprising an upper bushing insert of low friction polymer material attached to an inner portion of said frame portion.

19. The stop assembly of claim 18 comprising a lower bushing insert of low friction polymer material attached to an inner portion of said frame portion.

20. The stop assembly of claim 11 wherein said disengagement element is a solenoid attached to said frame portion and operably connected to said engagement element.

21. A self-spotting apparatus for barbells and dumbbells comprising:

a frame;

a first weight engagement assembly selectively translatable along a first elongated weight support assembly attached to said frame and comprising a first solenoid operably  
5 connected to a first engagement element whereby said first weight engagement assembly is disengaged from said first elongated weight support assembly when said first solenoid is energized;

a second weight engagement assembly selectively translatable along a second elongated weight support assembly attached to said frame and comprising a second solenoid  
10 operably connected to a second engagement element whereby said second weight engagement assembly is disengaged from said second elongated weight support assembly when said second solenoid is energized; and

a control unit comprising a mode selector, said mode selector operably connecting a first dumbbell grip actuator to independently energize said first solenoid and a second  
15 dumbbell grip actuator to independently energize said second solenoid in a first mode and operably connecting a first barbell grip actuator through a series connection to a second

barbell grip actuator to energize both said first solenoid and said second solenoid in a second mode.